

## Module 1

### Sustainable Homes: Philosophy & Introduction

Portland: January 22 & 23, 2010

Bend: January 15 & 16, 2010

- 1.1 Philosophy of Green Building Programs
  - 1.1.1 Design Process Changes
  - 1.1.2 Construction Process Changes-Quality Management
- 1.2 Green Building Programs
  - 1.2.1 Program Details
  - 1.2.2 Applied Learning
- 1.3 Why Do Builders Want To Use a Green Building Rating System?
  - 1.3.1 What Is the Value of Certification?
  - 1.3.2 How Does Third-Party Verification Contribute?
- 1.4 Selling a House that Works
  - 1.4.1 Real Estate Market Tools
  - 1.4.2 Knowing the Marketplace
  - 1.4.3 Shades of Green
- 1.5 Broad Overview of Modules 2-6
- 1.6 The Administrative and Construction Management Process Impacts
  - 1.6.1 Incorporating Sustainability into Your Practice
  - 1.6.2 Incorporating Your Practices into Green Building Programs
  - 1.6.3 Codes and Policies
  - 1.6.4 Occupancy and Owner's Manuals

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#### OVERVIEW:

This module provides an exploration of the philosophy of sustainable residential building programs and offers an overview of various existing programs. Students will explore the details, benefits, and requirements of various sustainable building programs. Process management will be discussed in the context of green building and the course final project will be introduced.

## Module 1

### Knowledge Objectives

- Explore the philosophy, necessity, and benefits of various sustainable building programs.
- Understand the format, flow, and expectations of this course.

### Skills Objectives

- Identify various sustainable building programs and their features.
- Identify the process changes necessary to achieve green building goals.
- Describe strategies to incorporate planning, implementation, and documentation into your next project.

### Attitude Objectives

- Internalize the values of green building and commit to ensuring best practices in the field.
- Promote green building through effective communication of benefits.

## Module 2

### Building Science Fundamentals

#### 2.1 Fundamental Natural Laws of Thermodynamics

##### 2.1.1 Thermal Flows (Heat Transfer)

##### 2.1.2 Air

##### 2.1.3 Moisture

Activity: U-value and R-value Calculations

#### 2.2 The Importance of Place

##### 2.2.1 Integrated Holistic Energy Design

##### 2.2.2 The Other Influence

##### 2.2.1a Site Assessment

##### 2.2.1b Orientation and Solar Control

Activity: Calculate Solar Angle

Activity: Calculate heating and cooling degree days

Activity: Analyze orientation of a home

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#### OVERVIEW:

This module provides an exploration of the fundamental laws that govern the dynamic flows within a building in order to understand the interconnectedness of house systems. These fundamentals are necessary tools to use when making design, construction, and operation decisions that affect the sustainability of projects.

Portland: February 26 & 27, 2010

Bend: February 12 & 13, 2010

## Module 2

### Knowledge Objectives

- Understand the natural laws that drive the thermal, air, and moisture flows within a house.
- Develop strategies for analyzing how dynamic flows affect the performance of a house.
- Explore the importance of place and its impacts on building performance, occupant health and well-being, and resource efficiency.

### Skills Objectives

- Communicate building science fundamentals to others.
- Use actual house plans to calculate the overall UA of a house and analyze potential efficiency improvements.
- Calculate wall assembly u-factors and to evaluate the optimum orientation of a house.

### Attitude Objectives

- Utilize sound building science fundamentals to make optimum choices when designing and building / remodeling a home.
- Incorporate appropriate and reputable tools in decision-making.
- Appreciate the need for an improvement in current building practices.
- Internalize the values of green building and commit to ensuring best practices in the field.

## Module 3

### Integrated Design & Envelope Performance

#### 3.1 Integrated Design Process (IDP)

##### 3.1.1 Benefits of IDP

##### 3.1.2 Implementing IDP

#### 3.2 Building Envelope Performance

##### 3.2.1 Value of Constructability

##### 3.2.2 Design Choices

##### 3.2.3 Implementation

##### 3.2.4 Performance Testing and Diagnostics

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### OVERVIEW:

This module provides a tool for focusing the fundamentals through integrated design. Students will learn about the Integrated Design Process and how IDP enables a more cohesive team effort and a smarter, more sustainable design. Students will then put this into practice by analyzing the importance and details of the building envelope.

Portland: March 26 & 27, 2010

Bend: March 12 & 13, 2010

## Module 3

### Knowledge Objectives

- Articulate the intent and application of IDP.
- List potential insulation, ventilation, and water management strategies.

### Skills Objectives

- Select appropriate design features and assemblies according to project objectives.
- Integrate building envelope details into plans and specifications.
- Communicate strategies to trades.

### Attitude Objectives

- Incorporate IDP concepts into daily practice.
- Appreciate the necessity and benefits of IDP.
- Transform practices to include informed envelope decisions.

## Module 4

### Mechanical Systems & Performance Testing

Portland: April 16 & 17, 2010

Bend: April 9 & 10, 2010

#### 4.1 Integrated System Design

- 4.1.1 Review Climate Responsiveness/Passive Strategies
- 4.1.2 Review Load Minimization
- 4.1.3 Fuel Choice and Future Proofing
- 4.1.4 Integrating Mechanical Systems
- 4.1.5 Lighting
- 4.1.6 Sound

#### 4.2 Performance Testing & Verification

- 4.2.1 Forced Air Systems
- 4.2.2 Ventilation System Verification
- 4.2.3 Measurement & Verification

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#### OVERVIEW:

Students will first discuss load reduction and then explore many design and product options for conditioning systems within a home. Just as performance testing is necessary to verify the envelope construction, performance testing and verification of systems are also key components to high performance sustainable homes.

## Module 4

### Knowledge Objectives

- Recognize the relative impact of various building components and system types on the total energy load of a house.
- Become familiar with residential system types, their applications, limitations, and benefits.
- Understand lighting design approaches and technologies, as well as daylighting benefits and limitations.
- Understand various types of performance testing and verification techniques and analysis.

### Skills Objectives

- Evaluate system types using actual house plans.
- Complete room-by-room load calculations for an example house.
- Select appropriate systems according to the project objectives.
- Communicate integrated system specifications to all project team members.

### Attitude Objectives

- Incorporate load reduction as the first step in system design in all future projects.
- Set performance goals for your next project.

## Module 5

### Health & Resources

Portland: May 21 & 22, 2010

Bend: May 14 & 15, 2010

#### 5.1 Health Impacts of the Built Environment

##### 5.1.1 Types of Pollutants and Risks

##### 5.1.2 Prevention and Mitigation: Indoor Pollutants

##### 5.1.3 Prevention and Mitigation: Outdoor Sources

#### 5.2 Materials

##### 5.2.1 Green Materials Considerations

##### 5.2.2 The Ideal Green Material – Does it Exist?

##### 5.2.3 Green Materials Tools and Resources

##### 5.2.4 Implementation

#### 5.3 Construction Waste Management

#### 5.4 Water

##### 5.4.1 The Need for Water Conservation

##### 5.4.2 Water Conservation Strategies

##### 5.4.3 Site Water Management

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### OVERVIEW:

This module explores the rationale for designing for a healthy indoor environment and conserving natural resources. Various health implications and associated preventative design and construction methods are explored. Additionally, innovative water conservation strategies are explored. Most importantly, successful integration of these strategies is stressed during exploratory activities and introspective surveys.

## Module 5

### Knowledge Objectives

- Document health risks in a home.
- List healthy and efficient alternatives to traditional materials and technologies.
- Practice a holistic materials approach concerning health and life cycle assessment.
- Explore strategies to improve water conservation both within a home and on site.
- Explore strategies to optimize a site's stormwater management.

### Skills Objectives

- Analyze various building materials using various green criteria.
- Identify local and regional sources for optimum material selection.
- List strategies for reducing water consumption within a house and outside a house.
- List strategies for reducing a site's impact on fish and wildlife habitat.

### Attitude Objectives

- Adhere to design and construction strategies to create healthy indoor environments that are resource efficient.
- Recognize the need for water and resource conservation.
- Incorporate low-impact development (LID) practices in all

## Module 6

### Process and Synthesis

#### 6.1 Importance of Process Management

##### 6.1.1 Scenario Exercises

#### 6.2 Final Project Presentations

#### 6.3 Course Review

#### 6.4 Marketing yourself as a Sustainable Homes Professional

#### 6.5 Graduation

#### 6.6 Certification Exam

### OVERVIEW:

This module will utilize the knowledge and skills acquired in Modules 1-5 and will emphasize the integration of these into your own process. Your end goal is to have the tools and confidence to provide comprehensive green process management to future projects.

Portland: June 18 & 19, 2010

Bend: June 11 & 12, 2010

## Module 6

### Knowledge Objectives

- Identify stages within the integrated design process.
- Identify potential team members involved in an integrated project.

### Skills Objectives

- Utilize project management tool developed throughout course.
- Identify strategies within each project stage to meet project objectives.
- Create your own green project process management tool.

### Attitude Objectives

- Promote sustainable building and design by passing forward information, skills, and inspiration gained in this course.
- Empathize with various trades, skill levels, language levels, and experience levels.